

Notice of Allowability

Application No.

10/091,774

Examiner

Dipakkumar Gandhi

Applicant(s)

MORIOKA ET AL.

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/22/2005.
2. ☒ The allowed claim(s) is/are 1-14 and 16-20, which are renumbered as 1-19.
3. ☒ The drawings filed on 22 March 2005 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


ALBERT DECADY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Allowable Subject Matter

1. Claims 1-14 and 16-20 are allowed. Claim 15 is canceled.
2. Applicants' amendment filed on 3/22/2005 (including amended claims and amended drawings) has been entered.
3. The following is an examiner's statement of reasons for allowance:

The present invention pertains to a combinational circuit, and an encoder, a decoder and a semiconductor device that use this combinational circuit. The present invention relates to a combinational circuit that can effectively correct errors, especially in a fast optical communication field. The claimed invention (claim 1 as representative) recites features such as: "...a combinational circuit comprising: a plurality of multipliers in a Galois extension field GF, wherein the multipliers include, an input side XOR calculator, an AND calculator, and an output side XOR calculator, and wherein said multipliers share said input side XOR calculator."

The prior arts of record teach the operations of the Galois Field multiplication function. The prior arts disclose a conventional AND-XOR structure for implementing the multiplication function (col. 9, lines 6-29, Riggle et al. is an example of such prior arts). The prior arts, however, do not teach using XOR-AND-XOR multiplier structure and multipliers sharing the input side XOR calculator. Hence, the prior arts of record do not anticipate nor render obvious the claimed inventions. Thus claim 1 is allowable over the prior arts of record. Claims 2-6 are allowed because of the combination of additional limitations and the limitations listed above.

4. The independent claim 16 also recites features such as: "...the combinational circuit includes: a plurality of multipliers in a Galois extension field GF, wherein the multipliers include, an input side XOR calculator, and AND calculator, and an output side XOR calculator, and wherein said multipliers share said input side XOR calculator."

Claim 16 is also allowable over the prior arts of record for the same reasons mentioned above for claim 1. Claims 18-20 are allowed because of the combination of additional limitations and the limitations listed above.

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5. The independent claim 7 recites features such as: "...a plurality of multipliers, each of which includes an adder connected between an AND calculator and an output side XOR calculator, wherein said output side XOR calculator is used in common."

The prior arts of record teach a circuit used to compute syndromes simultaneously. The prior arts of record teach a conventional AND-XOR structure for realizing the multiplication function (figure 4, col. 11, lines 8-25, Riggle et al. is an example of such prior arts). The prior arts, however, do not teach a plurality of multipliers, each of which includes an adder connected between an AND calculator and an output side XOR calculator, wherein said output side XOR calculator is used in common. Hence the prior arts of record do not anticipate nor render obvious the claimed inventions. Thus claim 7 is allowable over the prior arts or record. Claims 8-14 are allowed because of the combination of additional limitations and the limitations listed above.

6. The independent claim 17 also recites features such as: "...the combination circuit includes: for a Galois extension field, the multipliers including an adder connected between the AND calculator and the output side XOR calculator, wherein the output side XOR calculator is used in common."

Claim 17 is also allowable over the prior arts of record for the same reasons mentioned above for Claim 7.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dipakkumar Gandhi whose telephone number is 571-272-3822. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dipakkumar Gandhi
Patent Examiner



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